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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,282	09/26/2006	Hirotooshi Ishii	295727US0PCT	6171

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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.
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EXAMINER

LEE, SIN J

ART UNIT	PAPER NUMBER
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1795

NOTIFICATION DATE	DELIVERY MODE
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06/01/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/594,282	Applicant(s) ISHII ET AL.	
	Examiner Sin J. Lee	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 March 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-23 and 33-49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18-23 and 33-49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. In view of the amendment, previous 102(b) rejection on claims 35-37 over Sakamizu et al (Journal of Photopolymer Science and Technology), previous 103(a) rejection on claim 42 over Sakamizu et al, previous 103(a) rejection on claims 18-23, 33 and 34 over Ueda et al (WO'315), previous 103(a) rejection on claims 35-41 over Ito'517 and previous 103(a) rejection on claim 42 over Ito et al'517 in view of Aoai et al'856 are hereby withdrawn.
2. In view of the amendment, the effective filing date for present claims 18-23, 33 and 34 is now April 5, 2004. In view of the certified English translation of the Japanese priority document (submitted August 5, 2008), the effective filing date for all of present claims is April 5, 2005.

Claim Rejections - 35 USC § 102

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 18, 20-22, 33 and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakayama et al ("A New Three-Component Photoresist Based on Calix[4]resorcinarene Derivative, a Cross-linker, and a Photo-acid Generator" (Bulletin of the Chemical Society of Japan, vol.71 pg.2979-2984 (1998)).

Nakayama's compound o-(p-hydroxybenzyl)-C4-RA(4) (with R being -H atoms) shown on pg.2980 teaches present compound of formula (1) in claim 18. Nakayama also teaches a photoresist composition (suitable for manufacturing semiconductor devices – see the first line following the abstract) containing such compound and an

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acid generator (see abstract). Nakayama's composition also contains a solvent (cyclohexanone) – see pg.2982, left-hand column, lines 8-10. Nakayama's composition is coated onto a silicon wafer, and the resist film is exposed to UV radiation and then developed.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakayama et al (“A New Three-Component Photoresist Based on Calix[4]resorcinarene Derivative, a Cross-linker, and a Photo-acid Generator” (Bulletin of the Chemical Society of Japan, vol.71 pg.2979-2984 (1998) in view of Aoai et al (5,683,856) and Zhong et al 7,013,965).

Nakayama is discussed above. Nakayama does not teach present purification method of claim 19. It is commonly known in the art that basic impurities tend to deactivate acids generated from photoacid generators thus causing a change in sensitivity and profile or line width of resist pattern as evidenced by Aoai (see col.2, lines 65-67, col.3, lines 2-10). Thus, one skilled in the art would have been motivated to keep the basic impurities content in Nakayama's composition as low as possible so as to prevent change in sensitivity and profile or line width or resist pattern. It is known in the art to remove basic impurities in a composition by treating the composition with acid and with ion exchange resins as evidenced by Zhong et al, col.5, lines 9-10. Therefore, it would have been obvious to one skilled in the art to reduce any basic impurity in

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Nakayama's composition by using art-known methods such as treating with acid and ion exchange resins in order to avoid problems caused by the presence of basic impurities.

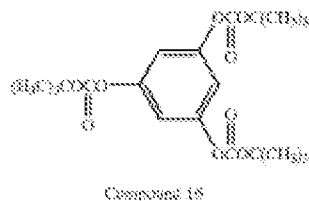
Therefore, Nakayama in view of Aoai and Zhong would render obvious present invention of claim 19.

7. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakayama et al ("A New Three-Component Photoresist Based on Calix[4]resorcinarene Derivative, a Cross-linker, and a Photo-acid Generator" (Bulletin of the Chemical Society of Japan, vol.71 pg.2979-2984 (1998) in view of Yamada et al (US 2003/0099900 A1).

Nakayama is discussed above. Although Nakayama does not teach present quenching agent of claim 23, it is known in the art, as evidenced by Yamada, [0078], that adding a quencher in a resist composition improves deterioration in abilities due to deactivation of an acid following leaving after exposure. It would have been obvious to one skilled in the art to add a quencher in Nakayama's resist composition in order to improve deterioration in abilities due to deactivation of an acid following leaving after exposure. Thus, Nakayama in view of Yamada render obvious present invention of claim 23.

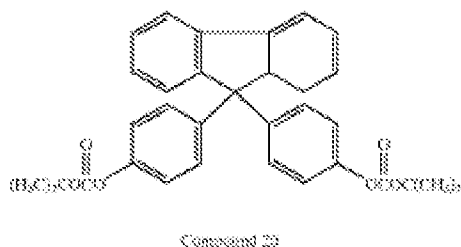
8. Claims 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanabata et al (US 2003/0211421 A1) in view of Yamada et al (US 2003/0099900 A1).

Hanabata teaches the following compound in Example 16;



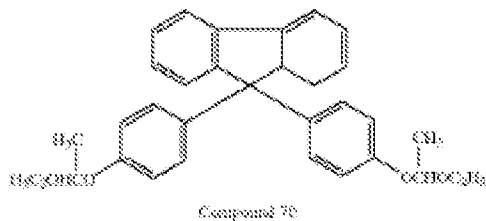
This compound teaches present compound of formula (2) of claim 35 (present X, Y and Z being ether bonds and present B, C and D being t-butyloxycarbonyl groups).

Hanabata teaches the following compound in Example 20;



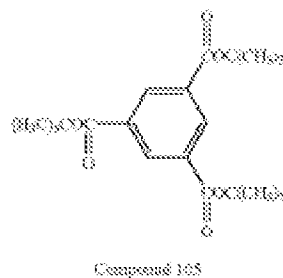
This compound teaches present compound of formula (2) of claim 35 (present I being 0, present m and n are 1 each, present Y and Z being single bonds and present C and D being Ar- substituted with RO- with R being t-butyloxycarbonyl group).

Hanabata teaches the following compound in Example 70;



This compound teaches present compound of formula (2) of claim 35 (present I being 0, present m and n are 1 each, present Y and Z being single bonds and present C and D being Ar- substituted with RO- with R being 1-ethoxyethyl group).

Hanabata teaches the following compound in Example 105;



Compound 105

This compound teaches present compound of formula (2) of claim 35 (present X, Y and Z being single bonds and present B, C and D being t-butyloxycarbonyl groups).

In Example 122 (see Table 1 and [0648]), Hanabata teaches a positive resist composition containing photosensitive resin 1 (which contains polyvinylphenol resin in which 35 mol% of hydroxyl groups are protected by 1-ethoxyethoxy group, polyvinylphenol resin in which 37 mol% of hydroxyl groups are substituted with t-butoxycarbonyloxy) group, an acid generator and a solvent) and the compound of Example 20 shown above. In Example 184, instead of the compound of Example 20, Hanabata used the compound of Example 70 shown above.

Although Hanabata does not teach present quenching agent of claim 35, it is known in the art, as evidenced by Yamada, [0078], that adding a quencher in a resist composition improves deterioration in abilities due to deactivation of an acid following leaving after exposure. It would have been obvious to one skilled in the art to add a quencher in Hanabata's composition in order to improve deterioration in abilities due to deactivation of an acid following leaving after exposure as taught by Yamada. Thus, Hanabata in view of Yamada renders obvious present inventions of claims 35 and 36 (since Hanabata teaches present compound of formula (2) of claim 35, and since

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present limitation " . . . organic compound shown by formula (2), obtained by washing with an acidic aqueous solution and processing with " an ion-exchange resin" is written in product-by-process claim language, it is the Examiner's position that Hanabata teaches present compound of formula (2) obtained by washing with an acidic aqueous solution and processing with an ion-exchange resin. It is also the Examiner's position that since Hanabata's compound teaches present compound of formula (2), his compound would inherently be in an amorphous state at room temperature and have an average diameter of the molecule being 2 nm or less).

9. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hanabata et al (US 2003/0211421 A1) in view of Yamada et al (US 2003/0099900 A1) as applied to claim 35 above, and further in view of Aoai et al (5,683,856).

Hanabata in view of Yamada is discussed above. Hanabata does not explicitly state present basic impurity content. However, it is commonly known in the art that basic impurities tend to deactivate acids generated from photoacid generators thus causing a change in sensitivity and profile or line width of resist pattern as evidenced by Aoai (see col.2, lines 65-67, col.3, lines 2-10). Thus, one skilled in the art would have been motivated to keep the basic impurities content in Hanabata's composition as low as possible so as to prevent change in sensitivity and profile or line width or resist pattern, and the present range of 10 ppm or less would have been obvious to one skilled in the art at the time the invention was made since it has been held that discovering an optimum value of a result effective variable involves only routine skill in

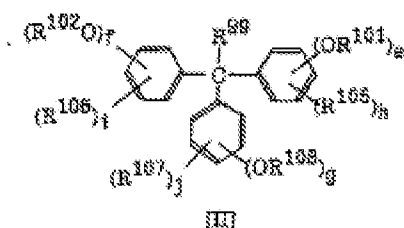
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the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Thus, Hanabata in view of Aoai renders obvious present invention of claim 42.

10. Claims 35-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoso (JP 2002-229193 and its machine-assisted English translation provided by JPO).

Aoso teaches (see English abstract) a positive resist composition containing (A) a compound having a disulfone group, (B) a low molecular dissolution inhibiting compound and (C) an alkali-soluble resin. Aoso also teaches the use of an acid diffusion controller (present quencher) – see [0015].

As one of examples for the component (B), Aoso teaches (see [0079]) the following;



Aoso teaches ([0091]) that e, f, g, h, i and j can each be 0 or 1-5. Aoso teaches ([0083]) that R^{101} , R^{102} and R^{108} can be *H atom*, $-R^0-COO-C(R^{01})(R^{02})(R^{03})$ or $-CO-O-C(R^{01})(R^{02})(R^{03})$, in which R^0 represents an *aliphatic* or aromatic moiety and $R^{01}-R^{03}$ can be an alkyl group such as a methyl group ([0073]-[0074]). It would have been obvious to one skilled in the art to have h, i and j to be 0; have e, f and g to be 1; have all of R^{101} , R^{102} and R^{108} to be $-R^0-COO-C(R^{01})(R^{02})(R^{03})$ with R^0 being methyl (methylene) group and $R^{01}-R^{03}$ being methyl groups with a reasonable expectation of obtaining a positive resist composition having satisfying sensitivity, resolution and resist shape. Thus,

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Aoso's teaching renders obvious present compound of formula (2) invention of claims 35 and 38 (present B, C and D being t-butoxycarbonylmethyl group and present X, Y and Z being an ether bond). *It would also have been obvious* to have h, i and j to be 0; have e, f and g to be 1; have R^{101} to be H atom and have R^{102} and R^{108} to be $-R^0-COO-C(R^{01})(R^{02})(R^{03})$ with R^0 being methyl (methylene) group and $R^{01}-R^{03}$ being methyl groups with a reasonable expectation of obtaining a positive resist composition having satisfying sensitivity, resolution and resist shape. Thus, Aoso's teaching also renders obvious present compound of claim 41. Therefore, Aoso's teaching renders obvious present inventions of claims 35-41.

11. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aoso (JP 2002-229193 and its machine-assisted English translation provided by JPO) in view of Aoai et al (5,683,856).

Aoso is discussed above. Aoso does not explicitly state present basic impurity content. However, it is commonly known in the art that basic impurities tend to deactivate acids generated from photoacid generators thus causing a change in sensitivity and profile or line width of resist pattern as evidenced by Aoai (see col.2, lines 65-67, col.3, lines 2-10). Thus, one skilled in the art would have been motivated to keep the basic impurities content in Aoso's composition as low as possible so as to prevent change in sensitivity and profile or line width or resist pattern, and the present range of 10 ppm or less would have been obvious to one skilled in the art at the time the invention was made since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205

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USPQ 215 (CCPA 1980). Thus, Aoso in view of Aoai renders obvious present invention of claim 42.

Double Patenting

12. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

13. Claims 35-49 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 4-6 and 25 of copending Application No. 10/531,208 in view of Kinsho et al (US 2003/0008232 A1). Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following reasons:

The photoresist base material of claim 5 (see also claims 4 and 6) of App.’208 teaches present inventions of claims 35 and 38 except for the photoacid (or photobase) generator and a quenching agent. However, it is known in the art that a photoresist

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composition typically contains a base resin, a photoacid generator as well as a basic compound, as evidenced by Kinsho (see [0054] and [0058]). It would have been obvious to one skilled in the art to include such components into the photoresist material of claim 5 of App.'208 with a reasonable expectation of success. Thus, App.'208 in view of Kinsho renders obvious present inventions of claims 35-42.

The photoresist base material of claim 25 (see also claim 6) of App.'208 teaches present compositions of claims 43-49 except for the photoacid (or photobase) generator and a quenching agent. However, it is known in the art that a photoresist composition typically contains a base resin, a photoacid generator as well as a basic compound, as evidenced by Kinsho (see [0054] and [0058]). It would have been obvious to one skilled in the art to include such components into the photoresist material of claim 25 of App.'208 with a reasonable expectation of success. Thus, App.'208 in view of Kinsho renders obvious present inventions of claims 43-49.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333. The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Sin J. Lee/
Primary Examiner, Art Unit 1795
May 23, 2009